New Experimental Data on Shifting of Zero Point of Twisted Quartz.

-75°C, 0°C, and 150-180°C, showed no difference in shifting of zero point. The first period, however, was again shortened after preliminary heating of the thread to 150-180°C.

Summary

The shifting of zero point of quartz gravimeters is caused by creep effect in the thread and by its plastic deformation during the first period after being twisted. This period can be shortened to 5-10 hrs (instead of 80-100 hrs) by means of a preliminary twisting or by exposing the thread to a temperature of 180-200°C prior to using it. To minimise the shifting the apparatus should be kept at 0°C, the thread should be made of highest quality quartz and its diameter should be not less than 30-40μ. There are 6 figures and 7 tables.

ASSOCIATION: Akademiya nauk SSSR, Institut fiziki Zemli (Academy of Sciences, USSR, Institute of Physics of the Earth)

SUBMITTED: June 5, 1957.

1. Gravity--Measurement

POPOV, Ye.I.

Estimating the accuracy of hypsometric mineral deposit maps.
Zap. LGI 37 no.1:168-181 '58. (MIRA 12:8)
(Mine maps) (Ores--Sampling and estimation)

Popov, Ye. I.

PHASE I BOOK EXPLOITATION SOV/3681

Akademiya nauk SSSR. Institut fiziki zemli

Voprosy instrumental'noy gravimetrii: (sbornik) (Problems of Instrument Gravimetry; Collection of Articles) Moscow, Izd-vo AN SSSR, 1959. 76 p. (Series: Its: Trudy, No. 8/175/) Errata slip inserted. 1,500 copies printed.

Ed.: Yu. D. Bulanzhe, Doctor of Physical and Mathematical Sciences; Ed. of Publishing House: V.G. Bergaut; Tech. Ed.: Yu.V. Rylina.

PURPOSE: This publication is intended for geophysicists, physicists, hydrographers, geodesists, and navigators.

COVERAGE: This is a collection of eight articles dealing with gravimetric instruments used in oceanographic investigations. Descriptions of the instruments and data on test results are given. No personalities are mentioned. References appear at the end of some of the articles.

AVAILABLE: Library of Congress

POPOV, Ye.I.

Quartz gravimeter for observations at sea. Trudy Inst. fiz. zem. no.8:32-41 '59 (MIRA 13:3)
(Gravimeter (Geophysical instrument)

S/049/59/000/12/008/027
E032/E591

AUTHOR: Popov, Ye. I.

TITLE: Measurements Made at Sea Using the Gravimeter "GAL"

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geofizicheskaya, 1959, Nr 12, pp 1793-1798 (USSR)

ABSTRACT: The measurements were carried out by the Aerogravimetric Laboratory of the Institute of Physics of the Earth, Ac.Sc., USSR between February and June, 1958, using three gravimeters type GAL and the apparatus RNU-1V (Refs 1 and 2). The measurements were carried out on board ship (6000 tons displacement) at ocean and enclosed-sea positions. The results of the measurements were verified on apparatus designed by L. V. Sorokin (TsNIIGAIK). The analysis of the data was based on Eq (1), the first term of which was determined as Eq (2), where n - number of gravimeters, K - rate of division (Table 1), ($\Delta n = m - m_o$) - difference between the readings at a given point and at the initial point, c - time drift of the gravimeter's zero point (Table 2), Δh - time at the initial point, ε - coefficient of damping, a - length of the pendulum, $R \approx 12 \cdot 10^{-5}$ - a

Card1/2

S/049/59/000/12/008/027
E032/E591

Measurements Made at Sea Using the Gravimeter "GAL"

constant, m_k and m_H - final and first readings, t_k and t_H - time of commencement and ending of the recording. The second term was defined as Eq (3) which represents a correction for the horizontal accelerations $\ddot{x}$, $\ddot{y}$. The third term was defined as Eq (4), where Δg_3 - correction for the Eötvös effect, v - speed of the ship, A - ship's course, φ - latitude. The error of the above calculations is determined from Eq (5) (Table 3). A comparison between the data obtained with the different gravimeters is given in Table 4 and a comparison between the data obtained with the gravimeters and the four-pendulum apparatus is shown in Table 5. The results obtained on separate occasions are compared in Table 6. The results obtained by the four different means are given in Table 7.

There are 7 tables and 3 Soviet references.

ASSOCIATION: Akademiya nauk SSSR, Institut fiziki Zemli
(Ac.Sc., USSR, Institute of Physics of the Earth)

Card 2/2

SUBMITTED: January 14, 1959

POPOV, Ye.I.

Methods for accurate hypsometric representation of mineral deposits using prospecting data. Zap. LGI 36 no. 2:178-189 '59. (MIRA 13:12)

(Ore deposits)

POPOV, Ye.I.

Observations with highly-damped gravimeters from airplanes and helicopters. Izv. AN SSSR. Ser. geofiz. no.8:1216-1219 Ag '60.
(MIRA 13:8)

1. Akademiya nauk SSSR, Institut fiziki Zemli i Aerogravimetricheskaya laboratoriya.
(Gravimeter (Geophysical instrument))
(Aeronautics in geology)

KUZIVANOV, V.A.; POPOV, Ye.I.

Processing marine observations with overdamped gravimeters.
Mor.grav.issl. no.1:100-108 '61. (MIRA 15:12)
(Gravimetry)

S/169/62/000/004/008/103
D228/D302

AUTHORS: Kuzivanov, V. A. and Popov, Ye. I.

TITLE: Processing marine observations with re-extinguished gravimeters

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 4, 1962, 18, abstract 4A136 (V sb. Morsk. gravimetr. issledovaniya, no. I, M., Mosk. un-t, 1961, 100-108)

TEXT: A method of processing marine observations with re-extinguished gravimeters is stated; it is based on theoretical data, experimental observations, and practical checking. These gravimeters have obtained their name because the damping of their resilience systems considerably exceeds the critical; the pendulum movement thereby becomes aperiodic, and the action of the short-period vertical accelerations abates sharply. In the USSR there are two designs of marine gravimeter with strongly damped quartz systems. Practical instructions are given for deciphering gravimeter-reading records on a photogram -- by allowing for distor-

Card 1/2

Processing marine observations ...

tions, induced by the strong damping, and also by taking into account the influence of disturbing vertical and horizontal accelerations, the zero-point shift, and the Eötvös effect. [Abstracter's note: Complete translation.]

Card 2/2

S/035/62/000/003/047/053
A001/A101

AUTHORS: Kuzivanov, V. A., Popov, Ye. I.

TITLE: Processing of marine observations with strongly damped gravimeters ("perezagashennyye" gravimetry)

PERIODICAL: Referativnyy zhurnal, Astronomiya i Geodeziya, no. 3, 1962, 32, abstract 3G220 (V sb. "Morsk. gravimetr. issledovaniya", no. 1, Moscow, Mosk. un-t, 1961, 100-108)

TEXT: The authors describe the method of processing marine observations with strongly damped gravimeters (RZhAstr, 1957, no. 6, 5178). There exist in the USSR two designs of marine gravimeters with strongly damped quartz systems: one was developed in the VNIIGeofizika (see 3G219) and the other, which was named ГАЛ (GAL), in the Institute of Physics of Earth, AS USSR (RZhAstr, 1960, no. 6, 5765; no. 7, 7088). Practical indications are given on deciphering readings of gravimeters on a photogram, on taking into account distortions caused by strong damping, and taking into account the effect of perturbing vertical and horizontal accelerations, zero-point drift and Eötvös effect.

P. Shokin

[Abstracter's note: Complete translation]

Card 1/1

POPOV, Ye.I.

Determination of gravity acceleration with GAL gravimeters from a submarine. Trudy Inst.fiz.Zem. no.24:86-115 '62. (MIRA 15:7)
(Gravimetry)

POPOV, Ye.I.

Determining the correction for the Eötvös effect in gravity acceleration measurements from the airplane. Izv. AN SSSR. Ser. geofiz. no.3:381-384 Mr '62. (MIRA 15:2)

1. AN SSSR, Institut fiziki Zemli.
(Gravimetry)

POPOV, Ye.I.

Estimating the accuracy of measuring gravity acceleration at sea by the use of gravimeters. Izv. AN SSSR. Ser. geofiz. no.1:30-53 Ja '62. (MIRA 15:2)

1. AN SSSR, Institut fiziki Zemli.
(Gravimetry)

POPOV, Ye.I.

Methods of processing the recordings of marine gravimeters and their precision. Izv. AN SSSR. Ser. geofiz. no.2:203-209 F '62. (MIRA 15:3)

1. Institut fiziki Zemli AN SSSR.
(Gravimetry)

POPOV, Ye.I.

Duration of observations made with greatly damped gravimeters on a moving base. Izv. AN SSSR. Ser. geofiz. no.9:1206-1214 S '62. (MIRA 15:8)

1. Institut fiziki Zemli AN SSSR.
(Gravimetry)

L 10386-63 EWT(1)/EDS/ES(v)--AFFTC--Pe-4/Pg-4/Po-4/Pq-4--TF
ACCESSION NR: AP3001049 S/0049/63/000/005/0740/0747

72
71

AUTHOR: Popov, Ye. I.

TITLE: Results of experimental airborne determinations of gravity acceleration

SOURCE: AN SSSR. Izv. Seriya geofizicheskaya, no. 5, 1963, 740-747

TOPIC TAGS: airborne gravity measurements

ABSTRACT: The purpose of the experiment was to determine the difference between the gravity acceleration on the ground and that in the air. In 1960 measurements were taken from an Il-14 aircraft equipped with three highly-damped GAL gravimeters suspended in gimbals, a gyrostabilized aerial camera with a 70-mm focal-length lens, two statoscopes, a radio altimeter, and two ranging devices (flight line indicators). Instrument readings were recorded synchronously on film, along with the time. Eight flights were made at heights of 3000 m and two at 2000 m in a N-S direction over an area where the Bouger anomalies amounted to a maximum of 6 mgls. The gravimeters were adjusted for established gravity values at the airport and compensations were made for instrument drift by interpolating the readings at takeoff and landing. For each flight a correction

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L 10386-63
ACCESSION NR: AP3001049

2

was also made for the true and programmed altitudes, which varied on the average by 100 m. Systematic errors, probably due to horizontal acceleration and tilt, averaged +51 mgl and depended on flight conditions. Other errors were due to lack of time for the instrument to stabilize on each strip of the survey flight. The accidental instrument error varied from + or - 5 mgl to + or - 10 mgl. The difference between gravity values observed in the air and on the ground, averaged over a total flight distance of 100 km, was -715 mgl, i.e., 51 mgl more than the computed difference. "In conclusion, I would like to take this opportunity to express my gratitude to Yu. D. Bulanzhe for his help in analyzing the observational data used in this article." Orig. art. has: 2 figures and 4 tables.

ASSOCIATION: Akademiya nauk SSSR. Institut fiziki Zemli (Academy of Sciences SSSR. Institute of Physics of the Earth)

SUBMITTED: 06Apr63 DATE ACQ: 19Jun63 ENCL: 00

SUB CODE: 00 NO REF SOV: 005 OTHER: 000

Card 2/2 ph/ps

POPOV, Ye.I.

Results of airborne experimental determinations of the gravity acceleration in the air. Izv. AN SSSR Ser. geofiz. no.5:740-747 My '63. (MIRA 16:6)

1. Institut fiziki Zemli AN SSSR.
(Gravimetry)

POPOV, Ye.I.

Use of gravimeters in measuring the acceleration of gravity in the air. Trudy Inst. fiz. Zem. no. 29:3-52 '63. (MIRA 17:6)

L 32563-66 EWT(l)/EWP(e)/EWT(m)/EEC(k)-2/EWP(b)/EWA(h) GW/WH
ACC NR: AR5014703 SOURCE CODE: UR/0270/65/000/005/0030/0031

AUTHOR: Bulanzhe, Yu.D.; Popov, Ye.I.; Tulin, V.A.

19
B

ORG: none

TITLE: Automatic processing of gravimetric observations

SOURCE: Ref. zh. Geodeziya. Otdel'nyy vypusk, Abs. 6.52.194

REF SOURCE: Sb. Vychisl. tekhn. v upravlenii. M., Nauka, 1964, 212-215

TOPIC TAGS: gravimetry, gravimeter, gravimetric analysis, aerial survey, data processing

TRANSLATION: The Aerogravimetric Laboratory of the Institute of the Physics of the Earth of the SSSR Academy of Sciences has developed a strongly damped gravimeter, based on the elastic properties of twisted quartz glass thread. The measurement of the force of gravity acceleration is made by the variation of the thread angle of twist. It is determined by the deflection angle of the pendulum. The instrument is used in naval gravimetry survey on submarines and surface ships, as well as for experimental work on aircraft. The time spent for processing of recordings, during which the effect of turbulent accelerations is excluded, significantly exceeded the time of observation. The special features and the conditions for automatic processing

Card 1/2 UDC: 528.27

L 32563-66

ACC NR: AR5014703

of gravimetric data were studied. By observation from low-speed submarine or surface vessels, the automatic computor has only to perform the operation of averaging the record for a given period of time. In observation from an airplane the functions of the computor are more complex. Computing slipping average values of gravimeter indications or the current values of integral from the function, which represents the motion of elastic system pendulum in time, can be considered as a preliminary problem in this case. The device transforming the movement of the gravimeter pendulum into an analogy or code system must have an accuracy of 2'.5. The most comprehensive way of taking readings is the method in which the measurement unit of the pendulum swing is the change of the distance between two blocks, reflected from the elastic system speculum. Other known methods (for example the volume one) will hardly secure the necessary accuracy. B.U.

SUB CODE: 09, 08

Card 2/2

POPOV, Ye.I.

Use of a liquid for the temperature compensation of elastic gravimeter systems. Trudy Inst. fiz. Zem. no.31:49-67 '64.
(MIRA 17:9)

L 15627-66 EWT(1) GS/GW

ACC NR: AT6006263 SOURCE CODE: UR/0000/65/000/000/0097/0108

AUTHOR: Popov, Ye. I.; Markov, G. S.

ORG: none

28
B+1

TITLE: Some results from investigations of gravimetric apparatus aboard ships in 1963-1964

12,44,55

SOURCE: AN SSSR. Institut fiziki Zemli. Apparatura i metody morskikh gravimetricheskikh nablyudeniy (Apparatus and methods of marine gravimetric observations). Moscow, Izd-vo Nauka, 1965, 97-108

TOPIC TAGS: gravimetry, surveying ship, marine equipment, gyrostabilized platform

ABSTRACT: The authors report on tests of gravimetric apparatus made from ships with a displacement of 1500 and 2600 t in May 1963 and January-February 1964 by the Institute of Physics of the Earth, AN SSSR, on the Black Sea. The equipment was combined into assemblies consisting of gyrostabilized platforms holding highly damped gravimeters and instruments for monitoring the accuracy of stabilization of the platforms and for evaluating the background of disturbing accelerations. These tests were conducted to: evaluate the convenience of using sets of gravimetric

Card 1/2

Card 2/2

POPOV, Ye. I.; SUKHODOL'SKIY, V. V.

Bench tests of marine gravimetric apparatus. Izv. AN SSSR. Ser. geofiz. no.6:801-818 Je '64. (MIRA 17:7)

1. Institut fiziki Zemli AN SSSR.

L 63395-65 EWT(1)/EWG(v) GS/GW

ACCESSION NR: AT5022964 UR/0000/65/000/000/0003/0022

AUTHOR: Popov, Ye.I.; Markov, G.S. 55 55

22
B+1

TITLE: Experimental gravimetric measurements made from a gyrostabilized platform aboard surface vessels

SOURCE: AN SSSR. Institut fiziki Zemli. 55 Apparatura i metody eksperimental'nykh issledovaniy po gravimetrii (Instruments and methods of experimental gravimetric research). Moscow, Izd-vo "Nauka", 1965, 3-22

TOPIC TAGS: gravimeter, gravimetry 12,55, research ship 12,55 instrumentation

ABSTRACT:

This paper reports on experimental gravimetric measurements carried out in the Barents Sea (1960) and Black Sea (1962) to test and compare the performances of two types of gravimeters-the highly damped GAL-S gravimeters developed by the Institute of Physics of the Earth (IFZ) 55 and an Askania-Werke Gss-2 gravimeter-mounted on gyrostabilized platforms whose

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L 63395-65

ACCESSION NR: AT5022964

tilts were controlled by photographing the horizon. Design details and specifications of the instruments, descriptions of the research programs and their execution, methods of data processing, and the results obtained are presented in detail. Orig. art. has 10 formulas, 4 graphs, and 4 tables.

ASSOCIATION: none

SUBMITTED:	19Jan65	ENCL:	00	SUB CODE:	ES
NO REF SOV:	005	OTHER:	000	FSB v.1, no.8	

Card 2/2

L 63402-65 EWT(1)/EWG(v) GS/GW
ACCESSION NR: AT5022965 UR/0000/65/000/000/0023/0038

AUTHOR: Popov, Ye. I.; Izmaylov, Yu. P.

TITLE: Investigations of A. Graf Fss-marine gravimeters

SOURCE: AN SSSR. Institut fiziki Zemli. Apparatura i melody eksperimental'nykh issledovaniy po gravimetrii (Instruments and methods of experimental gravimetric research). Moscow, Izd-vo "Nauka", 1965, 23-38

TOPIC TAGS: gravimeter, gravimetry, research ship instrumentation

ABSTRACT:

During the period 1960-1963, the Section of Experimental Gravimentry of the IFZ made laboratory field (submarine investigations of two Gss-2 marine gravimeters. This paper contains a block diagram and photograph of this instrument, lists its specifications, describes the procedures used in the laboratory and field tests (including instrument standardization) and gives the results of comparative experiments carried out at sea with the instruments suspended in gim als and mounted on gyrostablized platforms. Orig. art. has 3 figures, 1 formula, 4 graphs and 9 tables.

ASSOCIATION: none

Card 1/2

L 63402-65
ACCESSION NR: AT5022965

SUBMITTED: 19Jan65 ENCL: 00 SUB CODE: ES

NO REF SOV: 000 OTHER: 001 FSB v. 1, no. 8

Card 2/2

L 14495-66 EWT(1)/EWP(e)/EWT(m)/EWP(b) GS/GW/WH
ACC NR: AT6006258 SOURCE CODE: UR/0000/65/000/000/0003/0017

AUTHOR: Popov, Ye. I.; Tulin, V. A.

ORG: none

TITLE: A marine gravimeter with photoelectric micrometer

SOURCE: AN SSSR. Institut fiziki Zemli. Apparatura i metody morskikh gravimetricheskikh nablyudeniy (Apparatus and methods of marine gravimetric observations). Moscow, Izd-vo Nauka, 1965, 3-17

TOPIC TAGS: gravimeter, oceanic gravimeter, photoelectric micrometer

ABSTRACT: The authors describe the first model of an instrument they have developed for measuring gravity acceleration from a floating ship. The instrument is a quartz gravimeter with liquid temperature compensation and a spring system based on the elastic properties of twisted filaments. This system (the sensor for changes in gravity acceleration) consists of a quartz frame to which a quartz thread about 100 μ in diameter is fastened. A pendulum and mirror arrangement is welded to the middle of the thread. The moment created by the pendulum twists the thread through an angle of 300-500°. The spring system is housed in a square dura-

Card 1/4

lumin box which contains blocks made of this same material: one with the quartz system and the other with a stationary mirror. Each block is mounted on the bottom of the box on three screws and is held to the bottom by a pair of springs. The screws are used for controlling the position of the blocks with respect to the housing. The top of the box is hermetically sealed with a cover containing a plane-parallel protective glass over the mirrors. Four screws projecting from this cover are used for fastening the framework of the optical system. Cylindrical plugs along the edges of the cover allow access to the adjustment screws. The range of the spring system is adjusted by one of these screws. The housing is filled with a viscous silicone liquid, which acts as a damper for natural oscillations of the pendulum and for vibrations caused by disturbing tilts and acceleration and also compensates for variations in the position of the pendulum caused by changes in the temperature of the system. A diagram of the instrument is shown in Fig. 1. An optical system with a photoelectric micrometer is used for measuring the angle between the mirrors. The galvanometer in the photomultiplier circuit is adjusted so that it gives a zero reading when the bright spot is completely covered by screen 7 and a full-scale reading when the bright spot is completely uncovered. Thus, the visible width of the spot is magnified to the dimensions of the galvanometer scale.

L 14495-66

ACC NR: AT6006258

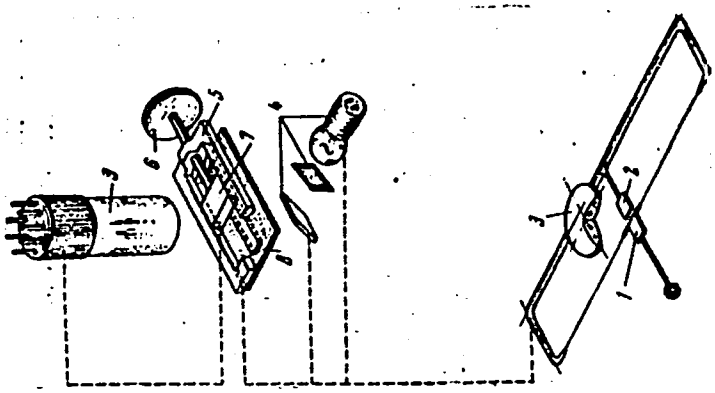

Fig. 1. Schematic diagram of the gravimeter with photoelectric micrometer: 1--movable mirror in the spring system; 2--stationary mirror rigidly fastened to the frame; 3--lens; 4--lamp with iris and mirror; 5--base of the photoelectric micrometer; 6--micrometer screw with reading device; 7--cover screen; 8--spot baffle; 9--photomultiplier.

The rectangular images from mirrors 1 and 2 are reflected onto screen 7 in the form of rectangles δ_H and δ_M (see Fig. 2). The micrometer screw measures the distance

Card 3/4

m between the centers of these images in millimeters, which is then converted to angular measure of milligals. A schematic diagram for the electrical circuit of the photoelectric micrometer is given. Orig. art. has: 8 figures and 8 formulas.

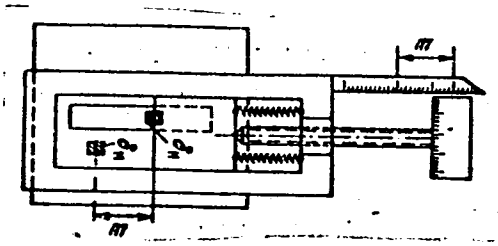

Fig. 2. Schematic diagram of the photoelectric micrometer

[14]

SUB CODE: 08, 09/ SUBM DATE: 29Oct65/ ORIG REF: 003/ ATD PRESS: 4198

L 5143-66 EWT(d)/EWT(l)/EWA(h)
ACCESSION NR: AP5026910

UR/0109/65/010/010/1907/1909
621.375.933.029.65

AUTHOR: Berlin, A. S.; Vizel', A. A.; Vystavkin, A. N.; Popov, Ye. I.; Khotuntsev, Yu. L.; Shtykov, V. D.

34
B

TITLE: Parametric amplification in the 8-mm band

25

SOURCE: Radiotekhnika i elektronika, v. 10, no. 10, 1965, 1907-1909

TOPIC TAGS: parametric amplification, millimeter wave

ABSTRACT: In recently published articles (B. C. DeLoach, Proc. IEEE, 1963, 51, 8, 1153 and others) on millimeter-band semiconductor amplifiers, no characteristics have been reported. The present article describes the design and characteristics of and indicates an application for an 8-mm-band parametric amplifier. Coaxial-design epitaxial germanium diodes with 0.04—0.08-pf capacitance and 3—5-v reverse voltage were used in most experiments; critical frequency at a bias of -3 v was 280—430 Gc. The diodes operated as amplifiers at a low pumping power and an operating-point bias of 0.5—2 v. The diodes were tested within -60 + 85C; up to +60C, the leakage current at -1.5 v was 1 μamp or less. The new diodes were tested in a single-cavity 8-mm parametric amplifier (see Fig. 1 of Enclosure). The signal is applied via a tapered waveguide matching unit 1. Behind the diode 4, a short-circuiting section 2 is arranged whose length equals an odd number of

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L 5143-66
ACCESSION NR: AP5026910

quarter-waves. The amplifier is tuned by a short-circuiting line 3 that has a characteristic resistance of 100 ohm. Transformer 5 serves for adjusting the coupling. With a gain of 20 db, the passband was 78 Mc and the noise temperature, 600 ± 150K. The parametric amplifier was used in a modulation-type radiometer whose fluctuation sensitivity was measured. Orig. art. has: 3 figures and 2 formulas. [03]

ASSOCIATION: none

SUBMITTED: 23Jan65 ENCL: 01 SUB CODE: EC.

NO REFO SOV: 002 OTHER: 003 ATD PRESS: 4134

Card 2/3

L 5143-66
ACCESSION NR: AP5026910

ENCLOSURE: 01

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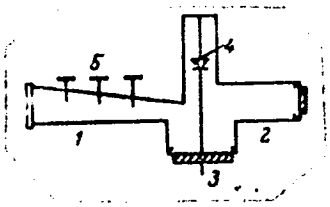

Fig. 1. A parametric semiconductor amplifier for the 8-mm band

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L 4551-66 FBD/EWT(l)/EWT(m)/EWP(t)/EWP(b)/EWA(h) IJP(c) JD/GW/WS-2

ACC NR: AP5026700 SOURCE CODE: UR/0141/65/008/005/0862/0869

AUTHOR: Popov, Ye. I.

ORG: Institute of Radio Engineering and Electronics, AN SSSR (Institut radiotekhniki i elektroniki AN SSSR)

TITLE: Radiometers for the submillimeter band using indium antimonide detectors

SOURCE: IVUZ. Radiofizika, v. 8, no. 5, 1965, 862-869

TOPIC TAGS: radio astronomy, radiometer, indium compound, radiation detecting device, semiconductor device, radiation sensitivity

ABSTRACT: The author analyzes several methodological and design problems involved in the construction of submillimeter-band radiometers based on volume effects in semiconductor detectors. Comparison of the fluctuation sensitivity (per unit solid angle and per unit antenna area) of radiometers operating with different types of detectors shows that for large objects, such as the Sun or the Moon, better results can be expected from thermal detectors (preferably operating at very low temperature) than from superheterodyne or crystal-detector receivers. This conclusion was checked by constructing a radiometer breadboard operating with a horn antenna having a directivity near 15° (at the 0.5-db level) and with an n-type InSb

Card 1/3 UDC: 621.396.628:523.164

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L 4551-66
ACC NR: AP5026700

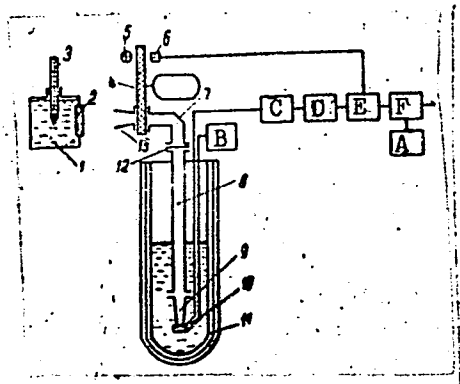

Fig. 1. Block diagram of the radiometer

1 - Hot water; 2 - teflon window; 3 - thermometer; 4 - mechanical modulator; 5 - modulator disk; 6 - RC circuit; 7 - quasi-optical mirror; 8 - German silver tube; 9 - conical junction; 10 - crystal; 11 - nitrogen jacket; 12 - photosensitive black paper; 13 - antenna horn

A - Automatic recorder; B - bias; C - low frequency preamplifier; D - low frequency amplifier; E - phase detector; F - dc amplifier.

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ACC NR: AP5026700

10

receiver at liquid helium temperature. The radiometer was found to have a sensitivity of 0.05K and accumulation time of 1 sec, in good agreement with the theoretical estimates. It is pointed out in the conclusion that the further increase in the detector sensitivity and decrease in the transmission-line losses can improve the sensitivity to a possible (1—3) x 10^{-3}K. The tuning range of such a radiometer can be broadened by using an interference type modulator. The author thanks A. N. Vystavkin[55] for general direction of the work, V. V. Migulin,[55] A. Ye. Basharinov,[55] and V. M. Polyakov[55] for useful discussions, and V. S. Ablyazov[55] for help in the work. Orig. art. has: 6 figures, 7 formulas, and 1 table. [02]

SUB CODE: AA, EC/ SUBM DATE: 17Apr65/ ORIG REF: 004/ OTH REF: 006
ATD PRESS: 4135

Card 3/3

POPOV, Ye.I., inzh.

Effect of maintenance methods on the improvement of the surface smoothness. Avt. dor. 21 no.2:17-18 F '58. (MIRA 11:2)
(Roads, Concrete--Maintenance and repair)

POPOV, Ye.I., inzh.

Determining the frequency of repair cycles necessary for maintaining asphalt concrete pavements. Trudy MADI no.23:214-223 '58. (MIRA 12:1)
(Pavements, Concrete--Maintenance and repair)

POPOV, Ye. I., Candidate of Tech Sci (diss) -- "Investigation of method of planning repairs and determining the service period between repairs and the work potential of railroad rights of way". Omsk, 1959. 21 pp (Min Higher Educ, Siberian Automobile and Road Inst im V. V. Kuybyshev), 150 copies (KL, No 21, 1959, 116)

POPOV, Ye.I.

Using cybernetics in railroad transportation. Vest.TSNII MPS no.1:56-57 F '59. (MIRA 12:3)

1. Uchenyy sekretar' Nauchno-tekhnicheskogo soveta Ministerstva putey soobshcheniya.
(Cybernetics) (Railroad engineering)

POPOV, Ye.I.

Road maintenance service in Kazakhstan. Avt. dor. 27 no.8:
24-25 Ag '64. (MIRA 17:12)

POPOV, Ye.I., kand.tekhn.nauk

Traffic on Kazakhstan roads must be uninterrupted. Avt.dor. 24 no.6:7 Je '61. (MIRA 14:7)
(Kazakhstan--Roads--Maintenance and repair)

POPOV, Ye. I. Cand Chem Sci -- (diss) "~~The utilization~~ Use of the isotopic - kinetic method for the study of certain heterogeneous catalytic reactions." Mos, [Publishing House of Acad Sci USSR], 1957, 12 pp. (Acad Sci USSR. Inst of Organic Chemistry im N.D. Zelinskiy) 130 copies. (KL, 8-58, 104)

POPOV, Ye. I., ISAGULYANTS, G. V., NEYMAN, M. B., BOGDANOVA, O. K., and BAJANDIN, A. A.

"Application of radio-carbon in investigating the mechanism of consecutive reactions of butane-butylene-divinyl," a paper submitted at the International Conference on Radioisotopes in Scientific Research, Paris, 9-20 Sep 57.

BALANDIN, A. A., NEYMAN, M. B., BOGDANOVA, O. K., ISAGULYANTS, G. V., SHCHEGLOVA, A. P. POPOV, Ye. I.

"Tagged-atom Study of the Dehydrogenation of Butane-Butylene Mixtures."

Problemy Kinetics and Catalysis, v. 9, Isotopes in Catalysis, Moscow, Izd-vo AN SSSR, 1957, 442p.

Most of the papers in this collection were presented at the Conf. on Isotopes in Catalysis which took place in Moscow, Mar 31- Apr 9, 1956

BALANDIN, A.A.; MEYMAN, M.B.; BOGDANOVA, O.K.; ISAGULYANTS, G.V.; SHEGLOVA, A.P.; POPOV, Ye.I.

Investigation of the dehydrogenation of C^{14} labelled butane-butylene mixtures. Izv. AN SSSR. Otd. khim.nauk no.2:157-165 F '57. (MLRA 10:4)

1. Institut organicheskoy khimii im. N.D.Zelinskgo i Institut khimicheskoy fiziki Akademii nauk SSSR.
(Dehydrogenation) (Carbon--Isotopes)
(Hydrocarbons)

BALANDIN, A.A.; MEYMAN, M.B.; BOGDANOVA, O.K.; ISAGULYANTS, G.V.; SHCHEGLOVA, A.P.; POPOV, Ye.I.

Process of carbon dioxide formation in obtaining divinyl from butane-butylene mixtures. Izv.AN SSSR.Otd.khim.nauk no.3:270-278 Mr '57. (MLRA 10:5)

1.Institut organicheskoy khimii im. N.D. Zelinskogo Akademii nauk SSSR i Institut khimicheskoy fiziki Akademii nauk SSSR.
(Carbon dioxide) (Butane) (Butylene)

Popov, Ye. I.

BALANDIN, A.A.; NEYMAN, M.B.; BOGDANOVA, O.K.; ISAGULYANTS, G.V.; SHCHEGLOVA, A.P.; POPOV, Ye.I.

Dehydrogenation of butane - butylene mixtures using tagged atoms. (MIRA 11:3)
Probl. kin. i kat. 9:45-60 '57.
(Dehydrogenation) (Butane)

BALANDIN, A. A., BOGKANOVA, O. K., ISAGULYANTS, G. V., NEYMAN, Yu. V., and POPOV, Ye. I.
(Inst. of Organic Chem. AS USSR.)

"Investigation of the Mechanism of Successive Reactions Butane-Butylene-Divinyl by Using Radioactive Carbon ~~XX~~ C14." p. 52.

Isotopes and Radiation in Chemistry, Collection of papers of 2nd All-Union Sci. Tech. Conf. on Use of Radioactive and Stable Isotopes and Radiation in National Economy and Science, Moscow, Izd-vo AN SSSR, 1958, 380pp.

This volume published the reports of the Chemistry Section of the 2nd AU Sci Tech Conf on Use of Radioactive and Stable Isotopes and Radiation in Science and the National Economy, sponsored by Acad Sci USSR and Main Admin for Utilization of Atomic Energy under Council of Ministers USSR Moscow 4-12 Apr 1957.

Popov, Ye. I.

AUTHORS: Balandin, A. A., Bogdanova, O. K., Isagulyants, G. V., Neyman, M. B., Popov, Ye. I. 62-1-4/29

TITLE: The Application of Radioactive Carbon in the Comparison Between the Dehydrogenation Velocities of Butane and Butylene (Primeneniye radiougleroda dlya sravneniya skorostey degidrogenizatsii butana i butilena)

PERIODICAL: Izvestiya AN SSSR Otdeleniye Khimicheskikh Nauk, 1958, Nr 1, pp. 18-23 (USSR)

ABSTRACT: The investigation (with the application of C^{14}) was carried out by means of a special catalyst under conditions especially favorable for the obtaining of divinyl. Since it turned out that divinyl can be formed from butylene and that butane cannot be transformed into divinyl, it was concluded that the reaction (divinyl from butane) passes only through the stage of the formation and desorption of butylene. Therefore the desorption of butylene cannot be a final stage of the entire reaction. The authors report on the carrying out of the investigation: The correlation between the dehydrogenation velocity of butane and butylene in divinyl at the chromium catalyst was found by means of computations -corresponding to the experimental data obtained already before. It was

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shown that the ratio of the velocities of the dehydrogenation of butane in butylene and of butane in divinyl is for both catalysts of the same order and corresponds to the ratio 20:1. In the experiments with chromium catalysts the velocity ratio in the formation of divinyl from butane corresponded to 1:1000 and in the experiments with an alumochromium catalyst to 1:25. Furthermore it was confirmed that the formation of divinyl from butane takes place over the stage of the formation of butylene. It was shown that the constants (in the denominator of the kinetic equation of dehydrogenation) represent adsorption coefficients. There are 6 figures, 4 tables, and 5 references, 4 of which are Slavic.

ASSOCIATION: Institute of Organic Chemistry imeni N. D. Zelinskiy, AS USSR (Institut organicheskoy khimii imeni N. D. Zelinskogo Akademii nauk SSSR).

SUBMITTED: January 4, 1957

1. Butane-Dehydrogenation 2. Butylene-Dehydrogenation 3. Carbon isotopes (Radioactive)-Applications 4. Chromium catalyst-Applications

Popov, Ye. I

AUTHORS: Balandin, A. A., Isagulyants, G. V., Popov, Ye. I., 62-2-18/28
Derbentsev, Yu. I., Vinogradov, S. L.

TITLE: The Application of Radioactive Carbon for the Investigation of the Dehydration Mechanism of Ethyl Alcohol Over Aluminum Oxide (Primeneniye radiougleroda dlya issledovaniya mekhanizma degidratsii etilovogo spirta nad okis'yu alyuminiya).

PERIODICAL: Izvestiya AN SSSR Otdeleniye Khimicheskikh Nauk, 1958, Nr 2, pp. 233-235 (USSR).

ABSTRACT: The problem of the above-mentioned dehydration mechanism has long been discussed in publications. Various authors assume that the formation of ethylene takes place over the stage of the formation of the diethyl ether. Others, however, think that ethylene and ethers form as a result of 2 independent parallel reactions. For the purpose of solving this problem the authors performed the dehydration of ethylene alcohol with addition of diethyl ether. See formulae (2),(3),(4). As the final result of the performed reactions showed, alcohol, ether and ethylene possess a spicific radioactivity (see figure 1). The authors determined: the dehydration velocity of ethyl alcohol and ether in ethalene as well as the common

Card 1/2

The Application of Radioactive Carbon for the Investigation of the Dehydration Mechanism of Ethyl Alcohol Over Aluminum Oxide. 62-2-18/28

conversion of alcohol and ether over aluminum oxide at 300° C. They found that ethylene forms in two different ways: directly from alcohol, and over ether. There are 2 figures, 1 table, and 8 references, 6 of which are Slavic.

ASSOCIATION: Institute for Organic Chemistry AN USSR imeni N.D. Zelinskiy (Institut organicheskoy khimii imeni N.D. Zelinskogo Akademii nauk SSSR).

SUBMITTED: September 21, 1957

AVAILABLE: Library of Congress

1. Carbon Isotopes (Radioactive)-Applications 2. Ethanol-Dehydration 3. Aluminum oxide-Applications

Card 2/2

AUTHORS: Yefremov, V.Ya., Popov, Ye.I. - SOV/32-24-9-40/53

TITLE: An Apparatus for Washing Mercury
(Pribor dlya promyvaniya rtuti)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol 24, Nr 9, pp 1152-1153 (USSR)

ABSTRACT: The apparatus recommended at present for washing mercury have some disadvantages. They employ, for instance, a technique that takes much time and where the operator is in contact with the mercury for a longer period of time. In the present paper an apparatus is described that operates according to the water - air lift effect. This way the mercury can be washed with water, acid- or alkaline solutions, and with several washing liquids at the same time. In this case the mercury passes each liquid separately according to the order desired. A diagram of the apparatus is given. It is mentioned that in the laboratory of the institute mentioned below some variables of such apparatus were devised. In the purification of larger quantities of mercury, for instance, the cascade variable of this apparatus is recommended. The diagram mentioned above represents a scrubber which at its lower end has two spherical mercury containers connected by a little tube at the side. By another thin tube the washing liquid is directed

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into the upper part of the scrubber, taking the non-purified mercury in small portions from the lower sphere. These small mercury quantities then sink through the washing liquid in the scrubber into the upper sphere. This process can be repeated until the mercury is purified. There is 1 figure.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR
(Institute of Chemical Physics, AS USSR)

ISAGULYANTS, G.V.; BALANDIN, A.A.; POPOV, Ye.I.; DERBENTSEV, Yu.I. (Moscow)

C^{14} tracer study of the dehydration mechanism of ethyl alcohol on aluminum oxide. Zhur. fiz. khim. 38 no.1:20-27 Ja'64.
(MIRA 17:2)

1. Institut organicheskoy khimii imeni N.D. Zelinskogo AN SSSR.

KASHERININOV, G.O.; LEVINSKIY, M.I.; STANKEVICH, V.A.; KOVTUN, T.D.; BELYAYEVA, I.I.; POPOV, Ye.I.; SMIRNOV, N.S.; SHAKHTAKHTINSKII, M.G.; KULIYEV, A.A.

Brief reports. Zav.lab. no.11:1403-1404 '59. (MIRA 13:4)

1. Institut Gipronikel' (for Kasherininov). 2. Institut goryuchikh iskopayemykh (for Belyayeva, Popov Smirnov). 3. Institut fiziki i matematiki Akademii nauk Azerbaydzhanskoy SSR (for Shakhtakhtinskiy, Kuliyev).
(Chemical apparatus)

SHORYGIN, P.P.; POPOV, Ye.M.

Unusual manifestations of the mutual influence of atomic groups in spectra of complex molecules. Dokl. AN SSSR 146 no.5:1132-1135 O '62. (MIRA 15:10)

(Chemical bonds) (Organic compounds--Spectra)

ISAGULYANTS, G.V.; BALANDIN, A.A., akademik; POPOV, Ye.I.

Determination of relative adsorption coefficients by isotopic dilution. Dokl. AN SSSR 139 no.1:139-141 Jl '61. (MIRA 14:7)
(Adsorption) (Radioactive tracers)

ACC NR: AP6017986 (N) SOURCE CODE: UR/0413/66/000/010/0086/0086

INVENTOR: Bashilov, I. P.; Bulanzhe, Yu. D.; Dubovik, A. S.; Yerofeyev, V. I.; Kevlishvili, P. V.; Kobrin, L. V.; Kogan, B. Ya.; Kaz'min, A. I.; Popov, Ye. I.; Mikhaylov, N. N.; Churbakov, A. I.; Shileyko, A. V.

ORG: None

TITLE: An automatic device for determining acceleration due to gravity on a movable base. Class 42, No. 181833 [announced by the Institute of Physics of the Earth imeni O. Yu. Shmidt, AN SSSR (Institut fiziki Zemli AN SSSR)]

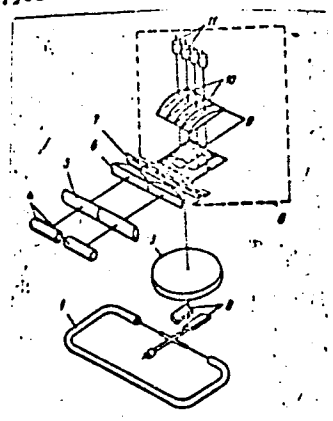
SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 10, 1966, 86

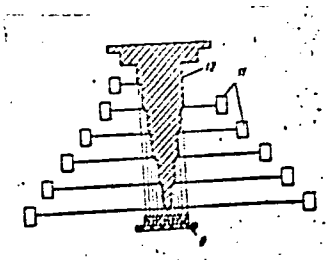
TOPIC TAGS: gravity, electron optics, electronic equipment, gravimeter

ABSTRACT: This Author's Certificate introduces an automatic device for determining acceleration due to gravity on a movable base, using a strongly damped elastic gravimeter system. The installation contains a meter for acceleration due to gravity, a system of mirrors, lens, light source, two condensers and a slotted prism. Accuracy of measurement is improved, and processing of the resultant information is automated by using an electron-optical converter which changes angles of turn of a pendulum to digital code. This converter is made in the form of a code mask with lenses attached. A prism is mounted behind the lenses with metallic mirrors and photocells.

Card 1/2 UDC: 531.768.08:528.026

ACC NR: AP6017986





1—accelerometer; 2—system of mirrors; 3—objective lens; 4—light source; 5 and 6—condensers; 7—slotted prism; 8—electron-optical converter; 9—code mask; 10—lenses; 11—photocells; 12—prism with metallic mirrors

SUB CODE: 09, 08/ SUBM DATE: 14May64

Card 2/2

ACC NR: AP6030145 (A) SOURCE CODE: UR/0120/66/000/004/0145/0148

AUTHOR: Popov, Ye. I.

ORG: Institute for Radio Technology and Electronics, AN SSSR, Moscow (Institut radiotekhniki i elektroniki AN SSSR)

TITLE: Application of an aperiodic interferometer to spectral investigations in the submillimeter region

SOURCE: Pribory i tekhnika eksperimenta, no. 4, 1966, 145-148

TOPIC TAGS: interferometer, microwave, spectroscopy, absorption spectrum, indium, antimony

ABSTRACT: An aperiodic interferometer using an n-InSb receiver working at liquid helium temperatures is described. The interferometer is designed for operation in the submillimeter wavelength region. The application of the interferometer to the study of spectral characteristics of filters and fast signals is illustrated, and a schematic of the experimental installation is also presented. The spectra were calculated according to

$$S(\nu_k) \simeq 0{,}7\ \nu_k^{-1}[F(\Delta_1) - F(\Delta_2) - F(\Delta_3) + F(\Delta_4) + \ldots],$$

without the use of a computer, after the method of P. L. Richards (J. Opt. Soc.

UDC: 535.214.4:621.317.757.39

Card 1/2

POPOV, Ye.I.; SHPAKOVSKAYA, Ye.I.

First all-Union scientific technical conference on the production of glass reinforced plastics. Plast. massy no.11 70-71 '65. (MIRA 18:12)

POPOV, Ye. I., Cand Tech Sci -- (diss) "Evaluation of structural mining-geometrical graphs of coal locations." Leningrad, 1960. 23 pp; with charts; (Ministry of Higher and Secondary Specialist Education RSFSR, Leningrad Order of Lenin and Labor Red Banner Mining Inst im G. V. Plekhanov, Chair of Mine Surveying Affairs); 200 copies; price not given; (KL, 25-60, 134)

GRUNENYSHEV, Nikolay Aleksandrovich, inzh.; SHKABEL'NIKOV, Gennadiy Petrovich, inzh.; GRIGOR'YEV, Pavel Vasil'yevich, inzh.; POPOV, Ye.I., inzh., red.; KHITROV, P.A., tekhn.red.

[Railroad motorcars; design, operation, and maintenance] Motovozy i avtodreziny; ustroistvo, ekspluatatsiia i ukhod. Moskva, Gos.transp.zhel-dor.izd-vo, 1959. 245 p. (MIRA 13:2)
(Railroad motorcars)

POPOV, Yevgeniy Ivanovich, inzh.; RAKOV, V.A., inzh., retsenzent; VISLOUKH, L.A., inzh., red.; SAVEL'YEV, Ye.Ya., red.izd-va; EL'KIND, V.D., tekhn.red.

[Rolling stock of electric railroads] Podvizhnoi sostav elektricheskikh zheleznykh dorog. Moskva, Gos.nauchno-tekhn. izd-vo mashinostroit.lit-ry, 1959. 162 p. (MIRA 13:2)
(Electric railroads--Rolling stock)

BOGDANOVA, V.I.; DOVGYALLO, V.P.; KUL'ZHONKOV, Ye.O.; POPOV, Ye.I.; RUTKOVSKIY, O.O.; SPEVACHEVSKIY, G.Yu.; NAZAREVSKIY, O.R., retsenzent; TRIFONOV, V.I., retsenzent; LEVITAS, I.G., red.; USENKO, L.A., tekhn. red.

[Moscow - Central Asia; railroad guide]Moskva - Srednia Aziia; zheleznodorozhnyi putevoditel'. Moskva, Transzheldorizdat, 1962. 205 p. (MIRA 16:3)
(Railroads—Guides)

Popov, Ye. M.

Tautomerism of acid esters of alkylthiophosphonic acids. T. A. Mastryukova, M. I. Kabachnik, S. I. Kurochkin, and V. P. Rodionova (Inst. S. T. Ioffe, E. M. Popov, Heteroorg. Compds., Acad. Sci. U.S.S.R., Moscow). Doklady Akad. Nauk S.S.S.R. 104, 861-4(1955); cf. Trudy Kievsk. Soveshchaniya Problemy Mekhanizma Org. Reaktsii, 1953; C.A. 48, 1770e.—Since the const. of tautomeric equil. K_{TS} in a solvent S can be related to the [illegible] constants K_T and K_S and activity coeffs. of [illegible] of the 2 forms, by the relation $K_{TS} = K_T f_{T}/K_S f_S$, the principle was applied to tautomerism of compds. of type RPS(OR)OH. These were prepd. by the reaction of $(RO)_2PSH$ with [illegible], treatment of the resulting Na salts with RX to form $RPS(OR)_2$, partial hydrolysis with NaOH, and neutralization with HCl. The following data were obtained for RPS(OR')OH (R, R', b.p., n_D^{20}, d_{20}, K in 7% EtOH, K in 80% EtOH, pK in 7% EtOH, pK in 80% EtOH, exptl. mol. wt. in C_6H_6, exptl. mol. wt. in PhOH given): Me, Et, $b_{0.4}$ 85-6°, 1.4927, 1.1757, 2.18 × 10^{-3}, 3.1 × 10^{-6}, 1.66, 3.51, 225.7, —; Et, Et, b_2 84.5-5.5°, 1.4916, 1.1337, 1.32 × 10^{-3}, 1.91 × 10^{-4}, 1.88, 3.72, 209.75, 152.40; Pr, Et, b_2 101-2°, 1.4875, 1.0974, 1.01 × 10^{-3}, 1.56 × 10^{-4}, 2.00, 3.81, 254.42, 168.95; Bu, Et, $b_{0.4}$ [illegible] 84.5-5°, 1.4831, 1.0721, 8.09 × 10^{-3}, 1.11 × 10^{-4}, 2.11, 3.95, 276.47, 174.61. A plot of pK_{EtOH} against pK_{H_2O} (cf. above references) indicates that the tautomeric shift in these acid esters favors the form RPS(OR)OH, over RPO(SH)OR [illegible] with that of $(RO)_2PO_2H$ and not $(RO)_2PS_2H$. [illegible]

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Tchechnik, M. I. [illegible]

[illegible] the extent of the shift [illegible] be made. Infrared spectra of [illegible] neutral esters listed below were [illegible] The neutral esters [illegible] $EtPS(OEt)_2$ [illegible] 1.4575, [illegible] $MePS(OEt)_2$, [illegible] 1.4616, [illegible]; $MePO(OEt)SEt$ b_{14} 106-8.5°, 1.4718, 1.0904; $EtPS(OBu)_2$, b_3 79.5-83°, 1.4533, 0.9775; $EtPO(OBu)SBu$, b_2 92-4°, 1.4660, 0.9951; $EtPS(OMe)OEt$, b_{14} 74-5°, 1.4685, 1.0647; $EtPO(SMe)OEt$, b_7 93.2°, 1.4780, 1.1025; $EtPS(OEt)_2$, b_6 78-8.5°, 1.4576, 1.0311 and $EtPO(OEt)SEt$, b_4 97.7-8.2°, 1.4740, 1.0872. Treating $EtPS(OEt)OH$ with CH_2N_2 gave $EtPS(OMe)OEt$ and $EtPO(SMe)OEt$, while $MeCHN_2$ gave $EtPS(OEt)_2$ and [illegible] The relative [illegible] of the P=S and [illegible] esters were [illegible] the [illegible] ratio, [illegible] of tauto[illegible] of the [illegible] esters.

G. M. Kosolapoff

Popov, Ye. M.

KABACHNIK, M.I.; MASTRYUKOVA, T.A.; KUROCHKIN, N.I.; RODIONOVA, N.P.; POPOV, Ye.M.

Reactivity of alkali salts of alkylthiophosphinic acid esters. Alkylation and acylation. Zhur. ob. khim. 26 no.8:2228-2233 Ag '56. (MLRA 10:11)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Phosphinic acid) (Alkylation)

24(7) PHASE I BOOK EXPLOITATION SOV/1365

L'vov. Universytet

Materialy X Vsesoyuznogo soveshchaniya po spektroskopii. t. 1: Molekulyarnaya spektroskopiya (Papers of the 10th All-Union Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy) [L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies printed. (Series: Its: Fizychnyy zbirnyk, vyp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po spektroskopii. Ed.: Jazer, S.L.; Tech. Ed.: Saranyuk, T.V.; Editorial Board: Landsberg, G.S., Academician (Resp. Ed., Deceased), Neporent, B.S., Doctor of Physical and Mathematical Sciences, Fabelinskiy, I.L., Doctor of Physical and Mathematical Sciences, Fabrikant, V.A., Doctor of Physical and Mathematical Sciences, Kornitskiy, V.G., Candidate of Technical Sciences, Rayskiy, S.M., Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K., Candidate of Physical and Mathematical Sciences, Milyanchuk, V.S., Candidate of Physical and Mathematical Sciences, and Glauberman, A. Ye., Candidate of Physical and Mathematical Sciences.

Card 1/30

Card 13/30

POPOV, Ye. M.: Master Chem Sci (diss) -- "Investigation of the oscillating spectra of organothiophosphorus compounds". Moscow, 1958. 10 pp (Acad Sci USSR, Inst of Organoelemental Compounds), 110 copies (KL, No 13, 1959, 101)

SOV/51-6-5-5/34

24(7)

AUTHORS: Mayants, L.S., Popov, Ye.M. and Kabachnik, M.I.

TITLE: Calculation of Characteristic Vibrations in Compounds of Phosphorus (Raschet kharakteristicheskikh kolebaniy soyedineniy fosfora). Characteristic Vibrations of the Molecules POCl3, POBr3, PSCl3 and PSBr3 (Kharakteristicheskiye kolebaniya molekul POCl3, POBr3, PSCl3 and PSBr3)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 5, pp 589-593 (USSR)

ABSTRACT: The paper reports the results of calculation of vibrations of simple molecules with P=O and P=S bonds: POCl3, POBr3, PSCl3 and PSBr3. Following Allen and Sutton (Ref 3) it is assumed that the equilibrium configurations of all these molecules belong to the C_{3v} group (see figure on p 592) and that their general formula can be written ZPY_3, where Z = O or S and Y = Cl or Br. It follows that six fundamental frequencies should be observed in the vibrational spectra of the ZPY_3 molecules; three of these frequencies should be fully symmetric and three doubly degenerate. The authors used in their calculations the published interpretations of the Raman spectra (Refs 3-5) and the following generalised coordinates: Two variations of the bond lengths P--Z and P--Y_i (i = 1, 2, 3) and of the angles Y_i--P--Y_j (i, j = 1, 2, 3) and Z--P--Y_i (i = 1, 2, 3). These coordinates were denoted by letters

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Calculation of Characteristic Vibrations in Compounds of Phosphorus. Characteristic Vibrations of the Molecules $POCl_3$, $POBr_3$, $PSCl_3$ and $PSBr_3$.

Q, q_i, γ_k ($k \neq i, j$) and δ_i respectively. The equilibrium bond lengths were taken to be P=O = 1.58 Å, P--Cl = 2.02 Å, P=S = 1.94 Å, P--Br = 2.18 Å. Angles Y_i--P--Y_i and Z--P--Y_i were assumed to be tetrahedral. The force constants were chosen to obtain the best possible agreement between the calculated and observed Raman and infrared absorption frequencies. Designations of the force constants are in Table 1 and their values (in $10^6 cm^{-2}$) in Table 2. The calculations yielded frequencies and forms of the normal vibrations of the four molecules and the sensitivities of these frequencies to changes in the force constants, atomic masses, bond lengths and angles. The results are given in Tables 3-5. The form of fully symmetric vibrations ν_1 (P=O frequencies in $POCl_3$ and $POBr_3$ and P=S frequencies in $PSCl_3$ and $PSBr_3$) should, strictly, be determined by the coordinate Q but Table 5 shows that it is affected also by the coordinates q, γ and δ. There are 1 figure, 5 tables and [illegible] references, 5 of which are Soviet, 2 English, 2 German and 1 French.

SUBMITTED: June 11, 1958

Card 2/2

SOV/51-7-2-5/34

AUTHORS: Mayants, L.S., Popov, Ye.M. and Kabachnik, M.I.

TITLE: Calculation of the Characteristic Vibrations of Phosphorus Compounds (Raschet kharakteristichnykh kolebaniy soyedineniy fosfora). II. Characteristic Vibrations of the $(CH_3O)_3PO$ and $(CH_3O)_3PS$ Molecules (II. Kharakteristichnyye kolebaniya molekul $(CH_3O)_3PO$ i $(CH_3O)_3PS$).

PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, Nr 2, pp 170-177 (USSR)

ABSTRACT: In Part I (Ref 1) the authors reported the results of calculation of the normal vibrations of the $POCl_3$, $POBr_3$, $PSCl_3$ and $PSBr_3$ molecules and discussed vibrations of these molecules corresponding to the P = O and P = S frequencies. It was shown that the symmetrical vibration ν_1 of the four molecules mentioned above has not quite the form characteristic of the Q coordinate, which refers to the change of the P = O or P = S bond length. In order to determine the effect of coordinates which are further from Q on the vibration ν_1, the authors calculated the fully symmetric vibrations of the $(CH_3O)_3PO$ and $(CH_3O)_3PS$ molecules for certain estimated values of the force constants and they determined the sensitivity of frequencies to changes of these constants. Of the possible rotational isomers of the $(CH_3O)_3PO$ and $(CH_3O)_3PS$ molecules four models were selected (figure on p 171). The models I and II have

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Calculation of the Characteristic Vibrations of Phosphorus Compounds. II. Characteristic Vibrations of the $(CH_3O)_3PO$ and $(CH_3O)_3PS$ Molecules

the symmetry C_{3V}, the model III has C_3 symmetry (the C--O bonds lie in the plane normal to the third-order axis) and the model IV has C_S symmetry. The results obtained (Tables 2-6) and those of Part I (Ref 1) lead to the conclusion that the vibration ν_1 is very characteristic in form and frequency of the coordinate Q and related coordinates. The P = O and P--O frequencies are used to show that the models I and III are most likely isomers in solutions of $(CH_3O)_3PO$. There are 1 figure, 6 tables and 20 references, 11 of which are Soviet, 5 English, 3 German and 1 from an international journal.

SUBMITTED: November 24, 1958

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5 (3)

AUTHORS: Popov, Ye. M., Mastryukova, T. A., Rodionova, M. P., Kabachnik, M. I.

SOV/79-29-6-50/72

TITLE: The Vibration Spectra of the Organophosphorus Compounds (Kolebatel'nyye spektry fosfororganicheskikh soyedineniy). On the Problem of the Characteristics of the Frequency P=S (K voprosu o kharakteristichnosti chastoty P=S)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 6, pp 1998-2006 (USSR)

ABSTRACT: The investigation of the vibration spectra of phosphorus- and organophosphorus compounds leads to the conclusion that in molecules with the group P=O a vibration occurs in which this group plays the main role. For the structure and the analysis of the phosphorus compounds also the spectral characteristics of the group P=S is of interest. In order to determine the so-called characteristic frequencies of the group P=S the infrared spectra and the Raman effects of the organothiophosphorus compounds were obtained in parallel to the corresponding thiolphosphorus and phosphorus compounds. In the compounds investigated the bands connected with the group

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The Vibration Spectra of the Organophosphorus Compounds. On the Problem of the Characteristics of the Frequency P=S

SOV/79-29-6-50/72

P=S are in the range from 750 to 580 cm^{-1}. The frequency of the normal vibration of the molecule in which this group participates, is considerably subjected to the structural influences; in this connection each type of the substituents changes the frequency by a certain amount. The frequencies which are related to group P=S (Table 2) conserve their constant values only if the central phosphorus atom is surrounded by the same atoms or radicals. The bonds and the angles which have no common atom with the group P=S do not participate in the given oscillation and practically do not influence the frequency. A final explanation could not yet be given. The authors thank L. S. Mayants for valuable advice. There are 2 figures, 2 tables, and 18 references, 4 of which are Soviet.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Elemental Organic Compounds of the Academy of Sciences, USSR)

Card 2/3

KABACHNIK, M.I.; GILYAROV, V.A.; POPOV, Ye.M.

Imides of phosphorus acid. Report 7: Amideimidolic tautomerism of amides of pentavalent phosphorus acids. Izv.AN SSSR,Otd.khim.nauk no.6:1022-1030 Je '61. (MIRA 14:6)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Phosphosus acids) (Amides)

POPOV, Ye.M.; KABACHNIK, M.I.; MAYANTS, L.S.

Vibration spectra of organophosphorus compounds. Usp.Khim. 30 no.7:846-876 Jl '61. (MIRA 14:8)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Phosphorus organic compounds—Spectra)

KABACHNIK, M.I.; IOFFE, S.T.; POPOV, Ye.M.; VATSURO, K.V.

Trans-enolization. Part 1: Effect of solvents on the enolization of trans-fixed keto enols. Zhur.ob.khim. 31 no.7:2122-2131 Jl '61. (MIRA 14:7)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Ketone) (Isomerism)

KABACHNIK, M.I.; IOFFE, S.T.; POPOV, Ye.M.; VATSURO, K.V.

Transenolization. Part 2: Effect of solvents on the transenolization of α-alkylacetoacetic esters. Zhur.ob.khim. 31 no.8:2682-2692 Ag '61. (MIRA 14:8)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Acetoacetic acid) (Isomerization)

KABACHNIK, M.I.; GILYAROV, V.A.; POPOV, Ye.M.

Tautomerism of phosphamidines. Zhur.ob.khim. 32 no.5:1598-1604 My '62. (MIRA 15:5)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Phosphorus acids) (Amidines) (Tautomerism)

IOFFE, S.T.; POPOV, Ye.M.; VATSURO, K.V.; TULIKOVA, Ye.K.; KABACHNIK, M.I., akademik

Keto cis-trans-enol equilibrium of 3-alkylacetylacetones. Dokl. AN SSSR 144 no.4:802-805 Je '62. (MIRA 15:5)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Acetone) (Isomerization)

KOGAN, G.A.; POPOV, Ye.M.

Vibration spectra and special features of the structure of polyene compounds. Izv. AN SSSR. Ser. khim. no.8:1393-1401 Ag '64. (MIRA 17:9)

1. Institut organicheskoy khimii im. Zelinskogo AN SSSR.

POPOV, Ye.M.; KOGAN, G.A.

Vibration spectra and conjugation. Butadiene and linear polyenes.
Opt. i spektr. 17 no.5:670-678 N '64. (MIRA 17:12)

L 47327-66 EWT(m) EWP(j) RM

ACC NR: AR6025768 SOURCE CODE: UR/0058/66/000/004/D056/D056

AUTHOR: Kogan, G. A.; Ivanova, T. M.; Yanovskaya, L. A.; Kucherov, V. F.; Popov, Ye. M.

50 B

TITLE: Vibrational and electronic spectra of ethers of polyene carboxylic acids

SOURCE: Ref. zh. Fizika, Abs. 4D426

REF. SOURCE: Tr. Komis. po spektroskopii. AN SSSR, t. 3, vyp. 1, 1964, 113-124

TOPIC TAGS: ir spectrum, Raman spectrum, uv spectrum, carboxylic acid, electron spectrum, vibration spectrum, conjugate bond system

ABSTRACT: In order to study the mutual influence of functional groups of atoms through a system of conjugated bonds, the authors investigated the frequencies and integral intensities of the IR, Raman, and UV bands of polyene compounds of the type $X(CH{=}CH)_nCOOC_2H_5$ ($X = CH_3$, OC_2H_5, COH, NO_2, and $COOC_2H_5$; $n = 1 — 5$). On the basis of an analysis of the obtained data, the authors explain the causes of variations of these parameters and of the spectra of the compounds in the ground and excited states. [Translation of abstract].

SUB CODE: 20

Card 1/1 mjs

ACC NR: AP6032591

$$(C_2H_5)_3SiONa + ClP(OC_2H_5)_2 \rightarrow (C_2H_5)_3SiOP(OC_2H_5)_2 + NaCl$$
$$(C_2H_5)_3SiCl + NaPO(OC_2H_5)_2 \rightarrow (C_2H_5)_3SiOP(OC_2H_5)_2 + NaCl$$

$$(CH_3)_3SiONa + ClP(OC_2H_5)_2 \rightarrow (CH_3)_3SiOP(OC_2H_5)_2 + NaCl$$
$$(CH_3)_3SiBr + NaPO(OC_2H_5)_2 \rightarrow (CH_3)_3SiOP(OC_2H_5)_2 + NaBr$$

formed the same type of derivatives. Thione-thiol isomerization of $(CH_3)SiOPS(OC_2H_5)_2$ in a sealed ampoule with a small amount of ethyl bromide produced a thiol-type isomeric product. IR spectra indicate that the most probable structure of this isomer is $(CH_3)_3SiOPO(OC_2H_5)(SC_2H_5)$. Orig. art. has: 1 figure.

SUB CODE: 07/ SUBM DATE: 19Mar64/ ORIG REF: 006/ OTH REF: 009

Card 2/2

L 33156-66 EWT(m)/EWP(j) JW/RM

ACC NR: AR6016176 SOURCE CODE: UR/0058/65/000/011/D014/D014

57
B

AUTHORS: Yakovlev, I. P.; Sheynker, Yu. N.; Popov, Ye. M.

TITLE: Calculation of normal oscillations of methylamine

SOURCE: Ref. zh. Fizika, Abs. 11D96

REF SOURCE: Tr. Komis. po spektroskopii. AN SSSR, t. 3, vyp. 1, 1964, 10-18

TOPIC TAGS: molecular spectrum, molecular theory, amine, oscillation, VIBRATION SPECTRUM

ABSTRACT: On the basis of a calculation of the vibrational spectra of methylamine and its deuterium derivatives, the authors determine the force field of the molecule. The frequencies and forms of the normal oscillations of methyl- and ethylamine. The characteristic nature of the oscillations pertaining to the amino-group is investigated. It is shown in particular that the frequencies and intensities of the oscillations connected with the NH_3 group in the spectra of different amines are determined essentially by the force and electrooptical parameters of this group. [Translation of abstract]

SUB CODE: 20

LS

Card 1/1

POPOV, Ye.M.; KOGAN, G.A.

Relations between length, order and force constant of a carbon-carbon bond. Teoret. i eksper. khim. 1 no.3:295-304 My-Je '65. (MIRA 18:9)

1. Institut organicheskoy khimii imeni N.D. Zelinskogo AN SSSR, Moskva.

SHCRYGIN, P.P.; POPOV, Ye.M.

Characteristics of the mechanical properties of chemical bonds in polyatomic molecules. Zhur. fiz. khim. 38 no.6:1429-1433 Je '64. (MIRA 18:3)

1. Institut organicheskoy khimii AN SSSR.

L 59348-65 EPF(c)/EPR/EWP(j)/EWA(c)/EWT(m) Pc-4/Pr-4/Ps-4 RPL RM/WW
ACCESSION NR: AP5019337 UR/0020/64/158/006/1373/1375

AUTHOR: Mastryukova, T. A.; Shipov, A.E.; Abalyayeva, V. V.; Popov, Ye. M.; Kabachnik, M. I. (Academician)

TITLE: O- and S-alkylation of dialkylthiophosphate by triethyloxonium fluoboride

SOURCE: AN SSSR. Doklady, v. 158, no. 6, 1964, 1373-1375

TOPIC TAGS: alkylation, sodium compound, organic phosphorus compound, fluorinated organic compound, boride, isomer, isomerization

ABSTRACT: The alkylation of sodium diethylthiophosphate with triethyloxonium fluoboride was investigated in chloroform medium at equimolar ratios of the components. The reaction was found to result in the formation of the O- and S- derivatives. The infrared absorption spectra of the isomers were identical with the spectra of the corresponding known preparations of triethylthione and triethylthiol phosphates. No catalytic isomerization of the thione isomer to the thiol isomer was observed under the action of the fluoboride; a study of the competing reaction of alkylation of sodium diethyl thiophosphate and triethylthione phosphate by an insufficient amount of triethyloxonium fluo-

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L 59348-65
ACCESSION NR: AP5019357

boride showed that alkylation of the salt is more rapid than isomerization of the triethylthione phosphate.

Orig. art. has: 4 formulas.

ASSOCIATION: Institut elementoorganicheskikh soyedinenii Akademii nauk SSSR (Institute of Organoelemental Compounds, Academy of Sciences SSR)

SUBMITTED: 10Jul64 ENCL: 00 SUB CODE: OC, GC

NR REF SOV: 007 OTHER: 007 JPRS

Card 2/2

POPOV, Ye.M.; KOGAN, G.A.

Electro-optical parameters and intensities of the infrared absorption bands of 1.3-butadiene. Opt. i spektr. 18 no.3: 377-383 Mr '65. (MIRA 18:5)

POPOV, Ye.M.; KHOMENKO, A.Kh.; SHORYGIN, P.P.

Splitting of the vibration frequencies of multiple bonds of symmetrical molecules. Izv. AN SSSR Ser. knim. no.1:51-58 '65. (MIRA 18:2)

1. Institut organicheskoy khimii im. N.D. Zelinskogo AN SSSR.

MASTRYUKOVA, T.A., SHIPOV, A.E., [illegible], V.V., POPOV, Yu.M., KABACHNIK, M.I., akademik

O- and S-alkylation of a dialkylthiophosphate anion with triethyl oxonium borofluoride. Dokl. AN SSSR 158 no.6: 1373-1375 O '64. (MIRA 17:12)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.